



DEQ AIR QUALITY PROGRAM
 1410 N. Hilton, Boise, ID 83706
 For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
 04/03/07

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER			
1. Company Name	NxEdge, Inc.		
2. Facility Name	3. Facility ID No.		001-00202
4. Brief Project Description - Facility Equipment and Throughput Modifications One sentence or less			
PERMIT APPLICATION TYPE			
5. <input type="checkbox"/> New Facility <input checked="" type="checkbox"/> New Source at Existing Facility <input type="checkbox"/> Unpermitted Existing Source			
<input checked="" type="checkbox"/> Modify Existing Source: Permit No.: P-040007 Date Issued: 07/22/2005			
<input type="checkbox"/> Required by Enforcement Action: Case No.: _____			
6. <input checked="" type="checkbox"/> Minor PTC <input type="checkbox"/> Major PTC			
FORMS INCLUDED			
Included	N/A	Forms	DEQ Verify
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form GI – Facility Information	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form EU0 – Emissions Units General	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: <u>4</u>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU5 – Boiler Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form BCE - Baghouses Control Equipment	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form SCE - Scrubbers Control Equipment	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forms EI-CP1 - EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	PP – Plot Plan	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form FRA – Federal Regulation Applicability	<input type="checkbox"/>

DEQ USE ONLY
Date Received RECEIVED MAY 30 2008 Department of Environmental Quality State Air Program
Project Number
Payment / Fees Included? Yes <input type="checkbox"/> No <input type="checkbox"/>
Check Number

AIR QUALITY PERMIT TO CONSTRUCT MODIFICATION
APPLICATION FORM DOCUMENTATION

NxEdge, Inc.
7500 W. Mossy Cup
Boise, Idaho 83709

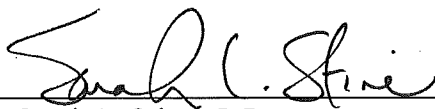
May 19, 2008

Prepared for: NxEdge, Inc.
7500 W. Mossy Cup
Boise, Idaho 83709

For the Facility at: 7500 W. Mossy Cup
Boise, Idaho 83709

Prepared by: TORF Environmental Management
3459 E. Boulder Heights Drive
Boise, Idaho 83712


(208) 345-7222
(208) 345-8285 FAX
www.torf.us



Sarah L. Stine, P.E.
Sr. Engineer
(208) 571-2393



Chris Johnson
Meteorologist



Handwritten signature and date:
5-19-2008

Table of Contents

1. SUMMARY.....	1-1
2. GENERAL INFORMATION – FORM GI DOCUMENTATION.....	2-1
3. GENERAL EMISSION UNITS – FORM EU0 DOCUMENTATION.....	3.1-1
3.1 STS Gen3 Tube Spray Chamber.....	3.1-1
3.2 STS Gen4 Tube Spray Chamber.....	3.2-1
3.3 STS Gen5 Tube Spray Chamber.....	3.3-1
3.4 STS Research and Development Spray Room	3.4-1
3.5 STS Bonder/Blaster and Finishing Stand	3.5-1
3.6 AEC Parts Preparation Room One	3.6-1
3.7 AEC Parts Preparation Room Two	3.7-1
3.8 C&R Parts Preparation Room	3.8-1
3.9 Fluoropolymer Area Curing Ovens.....	3.9-1
4. SPRAY PAINT BOOTHS – FORM EU3 DOCUMENTATION	4.1-1
4.1 FP Area Spray Booths.....	4.1-1
5. EMISSION INVENTORY WORKBOOK FORMS EI1-EI4 DOCUMENTATION	5-1
5.1 Criteria Pollutant Facility-Wide Point Source Emissions	5-1
5.2 Criteria Pollutant Facility-Wide Fugitive Emissions	5-1
5.3 Criteria Pollutant Facility-Wide Point Source & Fugitive Emissions Increase	5-1
5.4 Toxic Air Pollutant Facility-Wide Emissions	5-1
5.5 Toxic Air Pollutant Facility-Wide Emissions Increase.....	5-2
5.6 Hazardous Air Pollutant Facility-Wide Emissions	5-2
5.7 Facility-Wide Total Pollutant Emissions Increase.....	5-2
6. PLOT PLAN – FORM PP DOCUMENTATION	6-1
6.1 Facility Boundary	6-1
6.2 Building Dimensions.....	6-1
7. MODELING INFORMATION WORKBOOK - FORM MI1-MI4 DOCUMENTATION	7-1
7.1 Modeling Applicability Assessment	7-1
7.1.1 Criteria Pollutant Modeling Applicability	7-1
7.1.2 TAPs Modeling Applicability	7-1
7.2 Modeling Analyses Methodology.....	7-2

Table of Contents – Continued
 Permit to Construct Modification Application
 NxEdge, Boise, Idaho
 May 19, 2008

7.2.1	Model Used	7-2
7.2.2	Criteria Pollutant Modeling Methodology	7-2
7.2.3	TAPs Modeling Methodology	7-3
7.3	Model Input Data	7-3
7.3.1	Meteorological Data, Receptor Network	7-3
7.3.2	Emissions Release Parameters	7-7
7.3.3	Elevation Data	7-9
7.4	Evaluation of Compliance with Standards.....	7-9
8.	FEDERAL REGULATION APPLICABILITY – FORM FRA DOCUMENTATION.....	8-1
8.1	New Source Performance Standards.....	8-1
8.2	National Emission Standards for Hazardous Air Pollutants	8-1
8.3	Prevention of Significant Deterioration	8-1
9.	CERTIFICATION.....	9-1

List of Tables

Table 3-1A:	STS Area Emissions- Gen3 and Gen4.....	3.1-3
Table 3-1B:	Gen3 Deposition Efficiency.....	3.1-2
Table 3-2:	Gen4 Deposition Efficiency	3.2-2
Table 3-3A:	STS Area Emissions- Gen5	3.3-4
Table 3-3B:	Gen5 Deposition Efficiency.....	3.3-2
Table 3-4:	STS Area Emissions- Research and Development Room.....	3.4-3
Table 3-5A:	STS Area Emissions- Gen5	3.5-5
Table 3-5B:	Bonder Deposition Efficiency.....	3.5-3
Table 3-6A:	AEC Area Emissions- Parts Preparation Room One	3.6-3
Table 3-6B:	AEC Area Emissions- AEC and C&R Area Media Purchase Records.....	3.6-4
Table 3-7:	AEC Area Emissions- Parts Preparation Room Two	3.7-3
Table 3-8:	Cleaning and Refurbishment Area Emissions- Parts Preparation Room.....	3.8-3
Table 3-9:	Fluoropolymer Area Emissions- Curing and Burnoff Oven Emissions	3.9-3
Table 4-1:	Fluoropolymer Area Emissions- Spray Booths	4.1-3
Table 5-1:	Facility-Wide Criteria Pollutant Emissions.....	5-3
Table 5-2A:	Facility-Wide Toxic Air Pollutant Emissions.....	5-4
Table 5-2B:	Facility-Wide Annual TAP Emissions Summary.....	5-2
Table 5-3:	Facility-Wide Hazardous Air Pollutant Emissions.....	5-6
Table 7-1:	Emission Source Release Data	7-8
Table 7-2:	Emission Source Pollutant Rates	7-12
Table 7-3:	Comparison of Predicted Impacts with Applicable Ambient Standards.....	7-10

Table of Contents – Continued
Permit to Construct Modification Application
NxEdge, Boise, Idaho
May 19, 2008

List of Figures

Figure 7-1: Emission Sources, Building, and Property Boundary / Public Access Limits.....	7-4
Figure 7-2: Facility Emission Sources.....	7-5
Figure 7-3: Outer Receptor Network, with Boundaries and Buildings Limits	7-6

AIR QUALITY PERMIT TO CONSTRUCT MODIFICATION APPLICATION

NxEdge, Inc.
7500 W. Mossy Cup
Boise, Idaho 83709

1. SUMMARY

NxEdge, Inc. (NxEdge) proposes to modify the conditions of its Air Quality Permit to Construct (PTC) No. P-040007 issued for the facility at 7500 West Mossy Cup Street, Boise, Idaho. The modification includes changes to the permit conditions of existing air emissions sources, and the addition of new sources. New air emitting sources at the facility include metal blasting and coating equipment and blasting cabinets. The results of the inventory of estimated regulated air emissions associated with the modification and air dispersion modeling of those emissions demonstrate that the facility is eligible to receive a modified Idaho Air Quality Permit to Construct (PTC).

The facility will not be a major facility for the purposes of the Permit to Construct requirements.¹ Emission calculations demonstrate that permit-controlled NSR regulated pollutant rates are less than 100 tons per year. Controlled emissions of individual Hazardous Air Pollutants (HAPs) are less than 10 tons per year. Controlled emissions of combined HAPs are less than 25 tons per year. Therefore, the facility is not a major facility (qualifies as "synthetic minor") in terms of Tier I operating permit requirements.² Ambient concentrations of all Toxic Air Pollutants (TAPs) are within acceptable levels.³

¹ Idaho Department of Environmental Quality (IDEQ), Rules For The Control Of Air Pollution In Idaho, IDAPA 58 Title 01, Chapter 01, Section 200.

² Ibid., Section 008.10.

³ Ibid., Section 210.08.



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION

1. Company Name	NxEdge, Inc.
2. Facility Name (if different than #1)	
3. Facility I.D. No.	001-00202
4. Brief Project Description:	Facility Equipment and Throughput Modifications

FACILITY INFORMATION

5. Owned/operated by: (✓ if applicable)	<input type="checkbox"/> Federal government <input type="checkbox"/> County government <input type="checkbox"/> State government <input type="checkbox"/> City government
6. Primary Facility Permit Contact Person/Title	Carl Seelhoff
7. Telephone Number and Email Address	208-362-7200 cseelhoff@nxedgeinc.com
8. Alternate Facility Contact Person/Title	Nikolaos Xydias
9. Telephone Number and Email Address	208-362-7200 nxydias@nxedgeinc.com
10. Address to which permit should be sent	7500 W. Mossy Cup Street
11. City/State/Zip	Boise, ID 83709
12. Equipment Location Address (if different than #10)	
13. City/State/Zip	
14. Is the Equipment Portable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15. SIC Code(s) and NAISC Code	Primary SIC: 3471 Secondary SIC (if any): 3479 NAICS: 332812/332813
16. Brief Business Description and Principal Product	Application of Engineered Coatings, Precision Manufacturing, and Material Cleaning and Revitalization Services
17. Identify any adjacent or contiguous facility that this company owns and/or operates	7484 W. Mossy Cup Street (partial occupancy)

PERMIT APPLICATION TYPE

18. Specify Reason for Application	<input type="checkbox"/> New Facility <input checked="" type="checkbox"/> New Source at Existing Facility <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modify Existing Source: Permit No.: <u>P-040007</u> Date Issued: <u>07/22/2005</u> <input type="checkbox"/> Permit Revision <input type="checkbox"/> Required by Enforcement Action: Case No.: _____
------------------------------------	--

CERTIFICATION

IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.

19. Responsible Official's Name/Title	Tom Schiers/ Vice-President	
20. RESPONSIBLE OFFICIAL SIGNATURE	<i>Thomas Schiers</i>	Date: 5/23/08
21. <input checked="" type="checkbox"/> Check here to indicate you would like to review a draft permit prior to final issuance.		

2. GENERAL INFORMATION – FORM GI DOCUMENTATION

NxEdge currently operates with authorization of PTC No. P-040007 issued July 22, 2005. A PTC Modification Exemption Concurrence was received from Mike Simon on May 10, 2006, which allowed minor changes to emissions from the plasma and wire arc spray tube coating area. However, for this PTC Modification analysis, to allow comparison with the previous full-facility emissions analysis, all emission changes were calculated with respect to the original permit.



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name: NxEdge, Inc.	Facility Name:	Facility ID No: 001-00202
Brief Project Description:	Facility Equipment and Throughput Modifications	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	GEN 3 PLASMA SPRAY APPLICATOR (FOR SS TUBES)		
2. EU ID Number:	GEN3		
3. EU Type:	<input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:P-040007 Date Issued: 07/22/2005		
4. Manufacturer:	BRIGS		
5. Model:	BPC-180		
6. Maximum Capacity:	30.4 LB/HR POWDER		
7. Date of Construction:	2003		
8. Date of Modification (if any)	AWAITING PTC MODIFICATION APPROVAL - 2Q 2008		
9. Is this a Controlled Emission Unit?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 18.		

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:	Cyclone and Filter Assembly- MAC1					
11. Date of Installation:	2003	12. Date of Modification (if any):				
13. Manufacturer and Model Number:	Donaldson Torit Model 20 Cyclone & MAC 4M2F16 Filter Unit with high-efficiency cartridge filters (16)					
14. ID(s) of Emission Unit Controlled:	GEN3					
15. Is operating schedule different than emission units(s) involved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency	Pollutant Controlled					
	PM	PM10	SO ₂	NO _x	VOC	CO
	0.002 gr/scf	0.002 gr/scf				

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	48 HRS/WEEK, 50 WEEKS/YR
19. Maximum Operation	8760 HRS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, check all that apply below)
<input type="checkbox"/> Operation Hour Limit(s):	
<input type="checkbox"/> Production Limit(s):	
<input type="checkbox"/> Material Usage Limit(s):	
<input type="checkbox"/> Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
<input checked="" type="checkbox"/> Other:	EMISSION LIMITS ON ALUMINUM, SILICON AND PM10
21. Rationale for Requesting the Limit(s):	EMISSIONS MUST BE CONTROLLED TO COMPLY WITH AMBIENT AIR QUALITY STANDARDS

3. GENERAL EMISSION UNITS – FORM EUO DOCUMENTATION

There are nine General Emission Units associated with this PTC modification. Five are associated with the Sputtered Targets and Services (STS) process area, where stainless steel tubes are coated with metal powders and wires via the plasma spray and wire arc spray processes. Previously this was known as the Plasma (PL) Area and Glass Business Unit, or GBU.

Two other General Emission Units addressed in this modification are associated with the Advanced Engineered Coatings (AEC) process area, where parts of various dimensions are coated with metal powders via the plasma spray process. Previously, this was known as the Semiconductor Business Unit, or SBU.

Finally, there is one General Emission Unit associated with the Cleaning and Refurbishment (C&R) Area where metal parts are cleaned, and one associated with the Fluoropolymer (FP) Area where wet and powder coatings are applied to metal parts. These two business areas were previously known collectively as Engineered Coatings (EC).

3.1 STS Gen3 Tube Spray Chamber

The STS Gen3 Tube Spray Chamber (Gen3) is used to apply metal powder to 304 Stainless Steel tubes via the plasma spray process. This unit is permitted under the existing PTC and has undergone no equipment changes. NxEdge requests a change to the permit limits which will allow unrestricted coating of tubes (based on equipment capacity) with silicon and aluminum powder.

A Brigs Model BPC-180 Spray Gun is used to apply silicon and or a silicon-aluminum blend to the exterior of tubes typically measuring 6-10 feet long and 6 inches in diameter. Emissions from Gen3 are controlled via a downstream cyclone and cartridge filter assembly (MAC1). The cyclone is a Donaldson-Torit Model 20. The filter assembly is a MAC Model 4M2F16 loaded with 16 PTFE-coated polyester cartridges. A 1600 cubic feet per minute (CFM) rated fan located on the outlet of the filter assembly draws air from the process area, through the Gen3 chamber, and then through ducting to the cyclone and filter assembly. The fan discharges horizontally outside at a height of 14.7 feet.

The Gen3 emission point and two Gen4 emission points are located within a few feet of each other and all discharge horizontally at the same height. For air dispersion modeling purposes, the three emission points are combined into one, shown as EP-1 on Plot Plan Form PP (see Section 6). This approach was used and approved for the air dispersion modeling performed in support of the original permit.

Aluminum, silicon, and particulate emissions from Gen3 are calculated in Table 3-1A (attached). All particulate emissions are conservatively assumed to consist of particulate with a diameter of 10



microns or less (PM₁₀). Uncontrolled emissions were estimated using the maximum applicator rate, 24 hours per day, 365 days per year. Attached is a letter from Brig's Machining Company specifying the maximum throughput of the Brigs spray gun as 230 grams per minute (30.4 pounds per hour). NxEdge will pre-blend the silicon and aluminum when spraying a silicon-aluminum blend. Potential coating cracking issues limit the maximum aluminum concentration to 60 wt%.

Uncontrolled emissions are reduced by the amount of powder deposited on the tube. The average deposition efficiency (DE) in Gen3, as determined by NxEdge testing, is 27.9 wt%. Table 3-1B details the DE test results. A DE of 27 wt% was used in the Table 3-1A Gen3 calculations. The estimated uncontrolled emissions of silicon, aluminum, and particulate would violate ambient air quality standards. Therefore, controlled emissions are calculated.

Table 3-1B: Gen3 Deposition Efficiency

Date	Gen3 Tube ID No.	Pre-Coated Tube Weight (lbs)	Final Coated Tube Weight (lbs)	Coating Used (lbs)	Deposition Efficiency (%)
1-Sep-07	126D0029NXVDS-UNX	92.0	133.0	176.5	23.2%
2-Sep-07	126D0040NXVDS-UNX	91.5	133.9	162.3	26.1%
5-Sep-07	126D0034NXVDS-UNX	91.1	134.2	144.6	29.8%
5-Sep-07	126D0031NXVDS-UNX	92.0	134.3	142.0	29.8%
5-Sep-07	126D0030NXVDS-UNX	92.1	133.5	148.0	28.0%
6-Sep-07	126D0032NXVDS-UNX	91.8	132.6	137.4	29.7%
7-Sep-07	126D0013NXVDS-UNX	92.5	134.0	142.6	29.1%
7-Sep-07	126D0026NXVDS-UNX	91.5	134.3	139.5	30.7%
10-Sep-07	126D0037NXVDS-UNX	89.8	132.9	145.0	29.7%
10-Sep-07	126D0128VDS-1111	110.8	153.5	182.9	23.3%
13-Sep-07	126D0575VDS-1	96.0	149.7	201.6	26.6%
14-Sep-07	126D0226NXVDS	93.8	136.7	150.0	28.6%
Average =					27.9%

Controlled emissions are calculated based on continuous operations 8760 hours per year and maximum emissions of 0.002 grains per dry cubic foot air, as certified by the filter manufacturer. Attached is a performance statement from MAC Equipment Co. for the MAC1 filter unit. Based on this control efficiency and the rated fan capacity, the maximum 24-hr averaged controlled emissions of aluminum and silicon are 0.016 and 0.027 lb/hr, respectively. The maximum particulate emissions from Gen3 are 0.027 lb/hr and 0.12 tons per year. These are the proposed permit limits for Gen3.

Table 3-1A: STS Area Emissions- Gen3 and Gen4

EMISSION CALCULATIONS WITH UNRESTRICTED FEED AND PRODUCTION RATES																				
STS Source: PLGEN34	Tube Coating	Coating	Contents	CAS Number	Content Conc. (wt% per MSDS)	Application Device	Maximum Applicator Feed Rate (lb/hr) Notes 1,2	Coating in Pre-mixed Feed (Max %)	Daily Operating Hours	Maximum Daily Coating Use (lbs)	Yearly Operating Days	Maximum Annual Coating Use (lbs)	Coating Retention on Target (%) Note 3	Uncontrolled Hourly Emissions (lb/hr)	585 TAP Screening Level (lb/hr)	Uncont. Annual Emissions (lb/yr)	Cyclone- Filter Unit: Filter Type	Control Equipment Efficiency (%) Note 4	Controlled Hourly Emissions (lb/hr) Note 4	Controlled Annual Emissions (lb/yr)
		Aluminum Powder	Aluminum	7429-90-5	100.0%	Gen3: Brigs BPC-180	30.4	60%	24	438	365	159764	27.0%	13.3	0.667	116628	MAC 1: MAC PTFE-coated Polyester Cartridges	99.88%	0.016	144
		Silicon Powder	Silicon	7440-21-3	100.0%	Gen3: Brigs BPC-180	30.4	100%	24	730	365	266273	27.0%	22.2	0.667	194379		99.88%	0.027	240
		Titanium Dioxide Powder	TiO ₂	13463-67-7	100.0%	Gen4: Praxair SG-100	18.8	100%	24	452	365	164969	42.0%	10.9	non-TAP	95682	MAC 2: Coated Cellulose Cartridges	99.7%	0.033	287

Criteria Pollutants Emissions Summary	Gen 3/Gen 4 Plasma Spray	PM ₁₀ Significant Emission Rate (tons/yr)	Uncontrolled Annual Emissions		Controlled Hourly Emissions		Controlled Annual Emissions			
			Current Permit (ton/yr)	Proposed Mod. (ton/yr)	Current Permit (lb/hr)	Proposed Mod. (lb/hr)	Current Permit (ton/yr)	Proposed Mod. (ton/yr)	Emission Change, ton/yr	Emission Change, % of Significant
			PM ₁₀ (Note 5)	15	27.5	145.0	0.039	0.060	0.093	0.264

Hazardous Pollutants Emissions Summary	Gen3/Gen4
	No known HAPs emitted

Toxic Air Pollutants Emissions Summary	Gen3/Gen4 Plasma Spray	TAP Type (24 hr or Annual Ave. EL)	TAP Screening Emission Level (lb/hr)	Uncontrld.	Controlled Hourly Emissions					
				Proposed Mod. (lb/hr)	Current Permit (lb/hr)	Proposed Mod. (lb/hr)	Proposed Mod. (lb/yr)			
				Aluminum	585 (24 hr)	0.667	13.3	0	0.0165	144
				Silicon	585 (24 hr)	0.667	22.2	0.0283	0.0274	240

- Notes: 1. Per manufacturer, Brigs BPC-180 maximum throughput is 230 grams/minute (30.4 lb/hr) in ideal conditions.
2. Per manufacturer, Praxair SG-100 maximum throughput is 6 lbs/hr using aluminum powder with a SG of 1.37. Using TiO₂ powder MSDS SG of 4.3, max TiO₂ rate is 18.8 lb/hr.
3. Based on NxEdge testing (see Tables 3-1B and 3-2).
4. For MAC filters, controlled emission rate and cartridge filter efficiency is calculated based on the manufacturer's certification that maximum emissions are 0.002 grains/SCF for particle sizes of 0.5 micron and larger. Gen 3 fan rating = 1600 CFM. Gen4 is loaded with ECO filters rated at 99.7% control efficiency.
5. Total PM₁₀ emissions based on maximum possible Gen3 and Gen4 operations. Therefore Proposed Modification Uncontrolled PM₁₀ Rate is the sum of each applicator's maximum lb/hr feed rates less deposition efficiencies. Proposed Modification Controlled Rates include control equipment efficiency.



NxEdge PTC Mod

Gen3 Spray Applicator Max Throughput

23190 DEL LAGO • LAGUNA HILLS, CA 92653
PHONE: (949) 770-1160 FAX: (949) 770-6717
E-MAIL: INFO@LPPS.COM

DATE: JULY 2, 2007

TO: PAUL ROBINSON
NXEDGE, INC.
PHONE: (208) 362-7200
FAX: (208) 362-7248

FROM: Gary Hislop
BRIGS MACHINING
COMPANY
PHONE: (949) 770 1160
FAX: (949) 770 6717

PAGES: 2

RE: Throughput of BPC-180 PIASMA GUN

The BPC-180 Plasma Gun systems maximum throughput is 230 grams per minute in ideal conditions
Using the BPC-180 Plasma Gun with the 171D-Powder Feeder

We hope that this this is the information that you need. If you have any questions please feel free to call us. We look forward to working with you.

Best Regards

BRIG'S MACHINING COMPANY
Gary Hislop



TORF
ENVIRONMENTAL
MANAGEMENT

RECORD OF TELEPHONE CONVERSATION

3459 E. Boulder Heights Dr. Boise, Idaho 83712 208.345.7222 fax 208.345.8285 www.torf.us

Party(s): Sarah Stine and Tyler Drady
Project: Air PTC Modification
Date: January 29, 2008
Subject: MAC Documentation

Called MAC at 1-800-821-2476 to get documentation on MAC unit fans. Left message.

MAC Job numbers: 50014, 39112

Tyler called at 1410 hr (number blocked). He looked up the jobs on his computer.

50014
MACFlo cartridge unit
1555 cfm 4m2f16
A:C 0.9:1

39112
2m2f8 (2)
2300 cfm fan on each unit
a:c 1.3:1
2040 ft2 in each

He will send me some documentation/equipment specs backing up this information. He is located in SLC.

**FILTER EMISSIONS STATEMENT
FOR
PTFE Membrane Cartridges**

Customer: Lynn Plasma
Reference: MAC Job No. 50014 & 39112
Equipment: PTFE coated Spunbond Polyester Cartridges
Application: Fill in application or dust type

MAC Equipment, Inc. warrants its filters to be free of mechanical defects for a period of one year from the date of shipment in accordance with the "Warranty and Limitation" statement included with the original proposal.

MAC Equipment, Inc. also expects the emissions of its new PTFE membrane cartridges (QP842), when properly installed, applied and maintained, and when operated per the design parameters referenced in the original proposal and in accordance with the manufacturers operations manuals, to emit no more than approximately 0.002 gr. / dscf of air based on dry dust particle sizes of 0.5 microns and larger.

The Buyer will be responsible for any emissions testing expense and MAC Equipment Inc. reserves the right to be present during any emission tests and shall be notified at least 2 weeks prior to the testing. Emissions testing must be conducted within 30 days of start-up, or 60 days from equipment shipment.

Misuse, abuse, operating outside the stated parameters, and / or water, oil, or hydrocarbons will void the emissions expectation. MAC Equipment, Inc. shall not be held responsible for any failures or excess emissions due to upset operating conditions.

This emissions expectation is contingent upon MAC Equipment receiving a process dust sample for testing, analysis, and approval. Such testing could indicate another filter media as a more suitable choice. The expected emissions are also contingent upon an inlet grain loading acceptable to MAC Equipment.

Under no circumstances will MAC Equipment, Inc. be liable or responsible for incidental or consequential damages.

Adam DuBose
Test Lab Manager

Material Safety Data Sheet

SULZER

Sulzer Metco

Section 1. Chemical Product and Company Identification

Product name Metco 54, 54NS, 54NS-1, Sulzer Metco 4009, XPT-D009, AE 7906
Supplier **SULZER METCO (US) INC.**
1101 Prospect Avenue
Westbury, NY 11590-0201
Phone: (516) 334-1300
Emergency Phone: CHEMTREC 800-424-9300
Calls Outside the United States: 202-483-7616
Material Uses Metal industry: Used by Spraying

Section 2. Composition, Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Aluminium	7429-90-5	99-100	ACGIH TLV (United States, 2002). TWA: 2 mg/m ³ TWA: 10 mg/m ³ Form: Dust TWA: 5 mg/m ³ Form: Fume NIOSH REL (United States, 2001). TWA: 5 mg/m ³ Period: 10 hour(s). Form: Respirable fraction TWA: 10 mg/m ³ Period: 10 hour(s). Form: Total TWA: 5 mg/m ³ Period: 10 hour(s). OSHA PEL 1989 (United States, 1989). TWA: 15 mg/m ³ Form: Dust TWA: 5 mg/m ³ Form: Pyrophoric TWA: 5 mg/m ³ Form: Respirable fraction TWA: 5 mg/m ³ Form: Welding fume

Section 3. Hazards Identification

Physical State and Appearance Powder.

Emergency Overview **WARNING!**
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA.

Routes of Entry Not available.

Potential Acute Health Effects
Eyes Prolonged or repeated exposure to even very small quantities may be irritating (redness, tears and pain).
Skin May cause skin sensitization.
Inhalation Prolonged or repeated inhalation may be irritating (depressed respiration, coughing and sore throat).
Ingestion Not available.

Potential Chronic Health Effects
Carcinogenic Effects Classified None. by NIOSH [aluminium].

Medical Conditions Aggravated by Overexposure: Repeated or prolonged exposure is not known to aggravate medical condition.

METCO54			MSDS#	50-118
Date of issue	7/21/2003	Print Date	7/31/2003	Prepared by
				Sulzer Metco (US) Inc.

Stanford Materials Corporation

SERIAL NUMBER: **ME14P-001**
PAGE 1 OF 4

REVISED May 22, 2006

MATERIAL SAFETY DATA SHEET

This form may be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.
IDENTITY (As Used on Label and List): **SILICON, POWDERS AND PIECES**

SECTION I - PRODUCT IDENTIFICATION

Silicon, powder and pieces

Product Details: Silicon powders and pieces

Stock Number: ME14P

Manufacturer/Supplier:

Stanford Materials Corporation

4 Meadowpoint, Aliso Viejo, CA 92656, USA

Tel: (949) 362-1746, Fax: (949) 362-1810

<http://www.stanfordmaterials.com>UPC/EAN: 231-130-8SYNONYMS SiliconCHEMICAL FAMILY: Non-metalDOT HAZARD LABEL: No data.FORMULA: SiMOLECULAR WEIGHT: 28.09

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Silicon, powder and pieces

HAZARDOUS COMPONENTS (CHEMICAL NAME)

<u>NAME:</u>	Silicon		
<u>CAS #:</u>	7440-21-3	<u>PERCENTAGE:</u>	0.0 -100.0 %
<u>OSHA PEL:</u>	15 mg/m3	<u>ACGIH TLV:</u>	10 mg/m3
<u>OTHER LIMITS:</u>	5mg/m3 resp		
<u>SEC.302 (EHS):</u>	No	<u>SEC.304 RQ:</u>	No
<u>SEC.313:</u>	No		

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Silicon, powder and pieces

<u>PHYSICAL STATES:</u>	<input type="checkbox"/> Gas, <input type="checkbox"/> Liquid, <input checked="" type="checkbox"/> Solid
<u>BOILING POINT:</u>	2355.00 C (4271.0 F) to 2600.00 C (4712.0 F)
<u>MELTING POINT:</u>	1410.00 C (2570.0 F) to 1420.00 C (2588.0 F)
<u>SPECIFIC GRAVITY (WATER = 1):</u>	2.33 gm/cc at 25.0 C (77.0 F)
<u>DENSITY:</u>	No data.
<u>VAPOR PRESSURE (VS. AIR OR MM HG):</u>	1 mm at 1724.0 C (3135.2 F)



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name: NxEdge, Inc.	Facility Name:	Facility ID No: 001-00202
Brief Project Description:	Facility Equipment and Throughput Modifications	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	GEN 4 PLASMA SPRAY APPLICATOR (FOR SS TUBES)		
2. EU ID Number:	GEN4		
3. EU Type:	<input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:P-040007 Date Issued: 07/22/2005		
4. Manufacturer:	PRAXAIR		
5. Model:	SG-100		
6. Maximum Capacity:	17.2 LB/HR POWDER		
7. Date of Construction:	2003		
8. Date of Modification (if any)	AWAITING PTC MODIFICATION APPROVAL - 2Q 2008		
9. Is this a Controlled Emission Unit?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 18.		

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:	Cyclone and Filter Assembl- MAC2 A&B					
11. Date of Installation:	2003	12. Date of Modification (if any):				
13. Manufacturer and Model Number:	MAC Cyclone and two MAC 2M2F8 Filter Units fitted with high-efficiency Cartridge Filters (16 total)					
14. ID(s) of Emission Unit Controlled:	GEN4					
15. Is operating schedule different than emission units(s) involved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency	Pollutant Controlled					
	PM	PM10	SO ₂	NO _x	VOC	CO
	99.7%	99.7%				

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	48 HRS/WEEK, 50 WEEKS/YR
19. Maximum Operation	8760 HRS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, check all that apply below)
<input type="checkbox"/> Operation Hour Limit(s):	
<input type="checkbox"/> Production Limit(s):	
<input type="checkbox"/> Material Usage Limit(s):	
<input type="checkbox"/> Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
<input checked="" type="checkbox"/> Other:	EMISSION LIMITS ON PM10
21. Rationale for Requesting the Limit(s):	EMISSIONS MUST BE CONTROLLED TO COMPLY WITH AMBIENT AIR QUALITY STANDARDS

3.2 STS Gen4 Tube Spray Chamber

The STS Gen4 Tube Spray Chamber (Gen4) is used to apply metal powder to 304 SS tubes via the plasma spray process. This unit is permitted under the existing PTC and has undergone no equipment changes. NxEdge requests a change to the permit limits which will allow unrestricted coating of tubes (based on equipment capacity) with titanium dioxide powder.

A Praxair Model SG-100 Spray Gun is used to apply titanium dioxide to the exterior of tubes typically measuring 6-10 feet long and 6 inches in diameter. Emissions from Gen4 are controlled via a downstream MAC cyclone and cartridge filter assembly (MAC2). The filter assembly consists of two parallel MAC Model 2M2F8 Units each loaded with 8 fire retardant-coated cellulose/synthetic blend cartridges. Two 2300 CFM rated fans located on the outlets of the filter assemblies draw air from the process area, through the Gen4 chamber, and then through ducting to the outdoor cyclone and filter assemblies. The fans discharge horizontally directly above the filter assemblies at a height of 14.9 feet.

The two Gen4 emission points and the Gen3 emission point are located within a few feet of each other and all discharge horizontally at the same height. For air dispersion modeling purposes, the three emission points are combined into one, shown as EP-1 on Form PP. This approach was used and approved for the air dispersion modeling performed in support of the original permit.

Titanium dioxide particulate emissions from Gen4 are calculated in Table 3-1A (see Section 3.1). All particulate emissions are conservatively assumed to be PM_{10} . Uncontrolled emissions are estimated using the maximum applicator rate, 24 hours per day, 365 days per year. Attached is a specification sheet for the Praxair SG-100 spray gun stating the maximum throughput of the applicator as 6.0 pounds per hour when spraying AL-104 powder with a specific gravity of 1.37. The specific gravity of the titanium dioxide powder is 4.3 (see attached MSDS). Assuming a constant volume spray rate, the maximum spray rate for titanium dioxide is 18.8 pounds per hour.

Uncontrolled emissions are reduced by the amount of powder deposited on the tube. The average deposition efficiency (DE) in Gen4, as determined by NxEdge testing, is 42.3 wt%. Table 3-2 details the DE test results. A DE of 42 wt% is used in the Table 3-1A Gen4 calculations. The resulting uncontrolled emissions of PM_{10} would violate ambient air quality standards. Therefore, controlled emissions are calculated.

Table 3-2: Gen4 Deposition Efficiency

Date	Gen4 Tube ID No.	Pre-Coated Tube Weight (lbs)	Final Coated Tube Weight (lbs)	Coating Used (lbs)	Deposition Efficiency (%)
10-Sep-07	126D0706VDS	100.10	158.60	125.84	46.5%
9-Sep-07	126D0705VDS	100.00	161.00	128.35	47.5%
7-Sep-07	126D0704VDS	103.20	158.40	148.20	37.2%
6-Sep-07	126D0067VDS-11	102.10	159.70	137.70	41.8%
5-Sep-07	126D0126VDS-11111	99.40	157.30	130.04	44.5%
4-Sep-07	126D0569VDS-1111	98.80	165.00	160.14	41.3%
1-Sep-07	126D0666VDS-11	101.70	158.80	124.70	45.8%
31-Aug-07	126D0005NXVDS-UNX	90.50	154.10	146.70	43.4%
30-Aug-07	126D0020NXVDS-UNX	90.20	153.20	166.30	37.9%
29-Aug-07	126D0242NXVDS	95.20	159.80	174.40	37.0%
Average =					42.3%

Controlled emissions are calculated based on continuous operations 8760 hours per year and an emission control efficiency of 99.7 wt%, as certified by the filter manufacturer. Attached is a performance statement from ECO Environmental Filtration for the MAC2 filters. Based on this control efficiency, the maximum particulate emissions from Gen4 are 0.033 lb/hr and 0.14 tons per year. These are the proposed permit limits for Gen4.

Rev. 5/98

**PRAXAIR THERMAL
SG-100 SPRAY SYSTEM**

Gun	SG-100
Anode2083-484
Cathode	1083A-129
Gas Injector3083-112

Gases	<u>psi</u>	<u>(kPa)</u>	<u>Orifice</u>
Primary (Ar)	60	(414)	56
Secondary (He)	120	(827)	80(1)
Carrier (Ar)	30/35	(207/241)	77

Operating Voltage	28 to 32
Amps350 to 400

Spray Distance	3.0 to 4.0 inches (76 to 102 mm)
----------------------	-------------------------------------

Spray Rate (2)	5.0 to 6.0 lbs/hr (38 to 45 g/min)
----------------------	---------------------------------------

- (1) Adjust He flow to obtain voltage
(2) Powder feeder tamper not required

**METCO 7M/9M
PLASMA SPRAY SYSTEMS**

Gun	7M or 9M
7M/9M Nozzle (1)6H/732
Powder Port	#1

Gases	<u>psi</u>	<u>(kPa)</u>	<u>Flow</u>
Primary (Ar)	100	(690)	150
Secondary (H ₂)	50	(345)	10
Carrier (Ar)	100	(690)	37

Voltage (2)	70 to 75
Amperage495 to 505

Spray Distance	5.0 to 6.0 inches (127 to 152 mm)
----------------------	--------------------------------------

Spray Rate	6.0 to 6.5 lbs/hr (45 to 49 g/min)
------------------	---------------------------------------

- (1) Use argon distribution ring
(2) Adjust H₂ flow to obtain voltage

**PLASMA-TECHNIK SYSTEMS
M1000/A2000/A3000**

Gun	F4
Nozzle6 mm
Powder Port	
Size	1.8 mm
Angle	+15°
Gauge5.0 mm

Gases	<u>Flow l/min</u>
Primary (Ar)	38.0
Secondary (H ₂)	12.5
Carrier (Ar)	5.0

Amperage499 to 502
----------------	-------------

Spray Distance	6.5 to 7.0 inches (165 to 178mm)
----------------------	-------------------------------------

Spray Rate (1)	4.5 to 5.0 lbs/hr (34 to 38 g/min)
----------------------	---------------------------------------

- (1) Use L suction plate/spreader with stirrer motor on

RECOMMENDATIONS

The parameters presented above are intended as starting points. Modifications may be required based upon part geometry and coating usage. When requested, alternate parameters, using other gas combinations may be provided.

PRAXAIR AL-104, is a tightly controlled, premium grade, gas atomized, commercially pure aluminum powder. The powders' free flowing characteristics are owed to the sphericity of its individual particles. Coatings are suited for salvage/repair of either aluminum or magnesium components, corrosion protection of steel and high frequency shielding. There are not any apparent thickness limitations on coating build-up; however, the use of a nickel-aluminum bond coat of **PRAXAIR NI-109** is recommended.

Thermal spray powders, because of their fineness and high surface area may have a tendency to absorb moisture. Flow rate may be enhanced by storing in a drying cabinet or warming the powder for 2 hours, before usage, at 175°F to 200°F (80°C to 93°C). Remove the tamper proof seal and loosen the container cap prior to heating. To avoid possible powder segregation, gently tumble the storage container prior to dispensing the spray material to the powder feed unit.

PRAXAIR AL-104, and all thermal spray powders, should always be sprayed in a well ventilated area. Avoid skin contact or prolonged inhalation. When spraying **PRAXAIR AL-104** for long periods the operator should be wearing protective clothing.

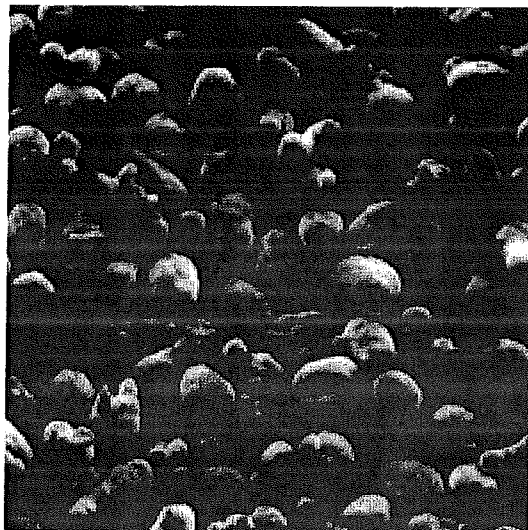
PRAXAIR SURFACE TECHNOLOGIES INC, 1555 MAIN STREET, INDIANAPOLIS IN 46224 • 317.240.2650 • 800.825.3093 • FAX 317.240.2225



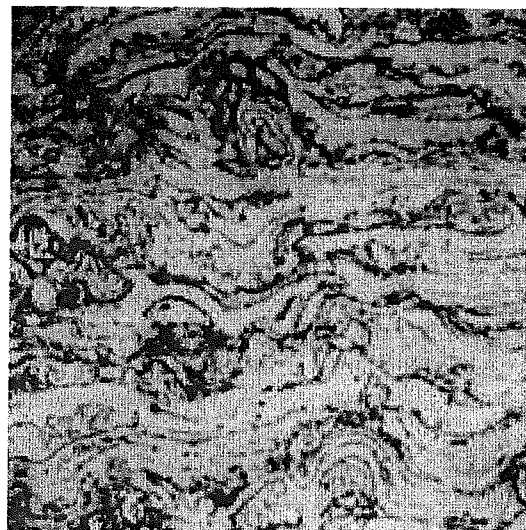
PRAXAIR
SURFACE TECHNOLOGIES

PRAXAIR AL-104

GAS ATOMIZED, SPHERICAL, FREE FLOWING PURE ALUMINUM POWDER
 PROVIDES ENVIRONMENTAL CORROSION PROTECTION FOR STEEL PARTS



Original Magnification: 100X



Original Magnification: 250X

TYPICAL POWDER PROPERTIES**Chemical Composition**

Aluminum99.0% Minimum

Sieve Analysis

-170 Mesh +325 Mesh(-90µm +45µm)

Melting Temperature

1220°F(660°C)

Hall Flow

53 seconds

Apparent Density

0.0495 lbs/cu. in.(1.37 g/cc)

TYPICAL COATING PROPERTIES**Hardness**

Rockwell 15T65 Minimum

Rb Conversion.....13 to 15

BHN500 Conversion.....70

Tensile/Bond Strength

3,000 psi, Minimum (20.685 MPa)

Over a roughened, grit blasted substrate

As-sprayed Surface Texture

Approximately 450 to 750 Ra

Specification Approval

GE Aircraft EngineB50TF57 CLA

Comparable Powders

Sulzer MetcoAmdry 357/Metco 54NS-1

PRAXAIR
 SURFACE TECHNOLOGIES

THERMAL SPRAY POWDERS

PRAXAIR
 SURFACE TECHNOLOGIES



Media Specification

ECOBLEND™ FR

**Composition: Cellulose / Synthetic Blend with
Fire Retardant Treatment**

<i>Basis Weight:</i>	<i>90 lbs/3000ft²</i>
<i>Thickness:</i>	<i>0.029 inches</i>
<i>Bursting Strength (Mullen Method):</i>	<i>44 psi</i>
<i>Air Permeability @ ½" wg (Frazer Method):</i>	<i>15 cfm</i>
<i>Max Operating Temp (continuous):</i>	<i>175 ° F</i>
<i>Efficiency:</i>	<i>99.7% @ 0.5 µm</i>

*All values are averages
Specifications are subject to change without notice*

MS-26005 (06/05)

3721 Collins Lane ♦ Louisville, KY 40245 ♦ Phone (502) 267-1807 ♦ Fax (502) 267-3045
www.ecoenvironmental.com

Material Safety Data Sheet

SULZER

Sulzer Metco

Section 1. Chemical Product and Company Identification

Product name Metco 102, AMDRY 6500, 6505, 6510, XPT-D 704, 707
Supplier SULZER METCO (US) INC.
1101 Prospect Avenue
Westbury, NY 11590-0201
Phone: (516) 334-1300
Emergency Phone: CHEMTREC 800-424-9300
Calls Outside the United States: 202-483-7616
Material Uses Metal industry: Used by Spraying

Section 2. Composition, Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Titanium Dioxide	13463-67-7	100	ACGIH TLV (United States, 2002). TWA: 10 mg/m ³ OSHA PEL 1989 (United States, 1989). TWA: 10 mg/m ³ Form: Total dust

Section 3. Hazards Identification

Physical State and Appearance Powder.

Emergency Overview WARNING!
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, SKIN.

Routes of Entry Not available.

Potential Acute Health Effects

Eyes Irritating to eyes. Exposure may result in impaired vision, tears, redness and pain.

Skin Exposure to high concentrations may result in health complaints. Prolonged or repeated exposure may be irritating (redness, pain).

Inhalation Exposure to high concentrations may result in health complaints. Irritating to respiratory system. Exposure may result in depressed respiration, coughing, nausea and sore throat. Prolonged or repeated exposure to large amounts may cause damage to lungs (lung edema).

Ingestion Prolonged or repeated exposure may be irritating to mouth, throat and esophagus (sore throat, nausea).

Potential Chronic Health Effects

Carcinogenic Effects Classified None. by NIOSH [titanium dioxide]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [titanium dioxide].

Medical Conditions Aggravated by Overexposure: Repeated or prolonged exposure is not known to aggravate medical condition.

Overexposure /Signs/Symptoms Not available.

See Toxicological Information (section 11)

METCO102

Date of issue 7/17/2003

Print Date

7/24/2003

MSDS#

50-136

Prepared by

Sulzer Metco (US) Inc.

**Metco 102, AMDRY 6500, 6505, 6510, XPT-D
704, 707****Page: 3/5****Protective Clothing
(Pictograms)**

Personal Protection in Case of a Large Spill Wear suitable protective clothing, gloves and eye/face protection.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Powder.
Color	Greyish.
Odor	Odorless.
Melting/Freezing Point	1750 to 2000°C (3182 to 3632°F)
Specific Gravity	3.9 to 4.3 (Water = 1)
Solubility	Solubility in water: Insoluble.

Section 10. Stability and Reactivity

Stability and Reactivity	Stable under normal conditions.
Hazardous Decomposition Products	Ozone and nitric oxide are formed by plasma flame. This action is independent of material.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

Chronic Effects on Humans	CARCINOGENIC EFFECTS: Classified None. by NIOSH [titanium dioxide]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [titanium dioxide]. Contains material which causes damage to the following organs: lungs, upper respiratory tract, skin.
Other Toxic Effects on Humans	No specific information is available in our database regarding the other toxic effects of this material for humans.

Section 12. Ecological Information**Ecotoxicity Data**

<u>Ingredient Name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Products of Degradation	Some metallic oxides.		
Toxicity of the Products of Biodegradation	The product itself and its products of degradation are not toxic.		

Section 13. Disposal Considerations

Waste Information	Methods of disposal: Disposal according to the local legislation. Waste of residues: Keep waste separate. Because of possible pollution, remove as industrial waste or hazardous waste. Contaminated packaging: Keep waste packaging separate. Because of possible pollution, remove as industrial waste or hazardous waste.
Waste Stream	Not available.
Consult your local or regional authorities.	

METCO102	MSDS#	50-136
Date of issue 7/17/2003	Print Date 7/24/2003	Prepared by Sulzer Metco (US) Inc.



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name: NxEdge, Inc.	Facility Name:	Facility ID No: 001-00202
Brief Project Description:	Facility Equipment and Throughput Modifications	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	GEN 5 COATING APPLICATOR (FOR SS TUBES)		
2. EU ID Number:	GEN5 (PLASMA OPS, SEE ALSO "WIRE OPS")		
3. EU Type:	<input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:P-040007 Date Issued: 07/22/2005		
4. Manufacturer:	BRIGS		
5. Model:	BPC-180		
6. Maximum Capacity:	30.4 LB/HR POWDER		
7. Date of Construction:	2003		
8. Date of Modification (if any)	AWAITING PTC MODIFICATION APPROVAL - 2Q 2008		
9. Is this a Controlled Emission Unit?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 18.		

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:	Cyclone and Filter Assembly- FARR2					
11. Date of Installation:	2003	12. Date of Modification (if any):	2Q 2008			
13. Manufacturer and Model Number:	Camfil-Farr Cyclone and GS24 Filter Assembly fitted with high efficiency cartridge filters (20)					
14. ID(s) of Emission Unit Controlled:	GEN5					
15. Is operating schedule different than emission units(s) involved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency	Pollutant Controlled					
	PM	PM10	SO ₂	NO _x	VOC	CO
	99.99%	99.99%				

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	48 HRS/WEEK, 50 WEEKS/YR
19. Maximum Operation	8760 HRS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, check all that apply below)
<input type="checkbox"/> Operation Hour Limit(s):	
<input type="checkbox"/> Production Limit(s):	
<input type="checkbox"/> Material Usage Limit(s):	
<input type="checkbox"/> Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
<input checked="" type="checkbox"/> Other:	EMISSION LIMITS ON TAPS AND PM10
21. Rationale for Requesting the Limit(s):	EMISSIONS MUST BE CONTROLLED TO COMPLY WITH AMBIENT AIR QUALITY STANDARDS



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

Company Name: NxEdge, Inc.	Facility Name:	Facility ID No: 001-00202
Brief Project Description:	Facility Equipment and Throughput Modifications	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	GEN 5 COATING APPLICATOR (FOR SS TUBES)		
2. EU ID Number:	GEN5 (WIRE OPS, SEE ALSO "PLASMA OPS")		
3. EU Type:	<input type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input checked="" type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:P-040007 Date Issued: 07/22/2005		
4. Manufacturer:	SULZER METCO		
5. Model:	SMARTARC PPG		
6. Maximum Capacity:	70 LB/HR WIRE		
7. Date of Construction:	2003		
8. Date of Modification (if any)	AWAITING PTC MODIFICATION APPROVAL - 2Q 2008		
9. Is this a Controlled Emission Unit?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 18.		

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:	Cyclone and Filter Assembly- FARR2					
11. Date of Installation:	2003	12. Date of Modification (if any):	2Q 2008			
13. Manufacturer and Model Number:	Camfil-Farr Cyclone and GS24 Filter Assembly fitted with high efficiency cartridge filters (20)					
14. ID(s) of Emission Unit Controlled:	GEN5					
15. Is operating schedule different than emission units(s) involved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency	Pollutant Controlled					
	PM	PM10	SO ₂	NO _x	VOC	CO
	99.99%	99.99%				

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	48 HRS/WEEK, 50 WEEKS/YR
19. Maximum Operation	8760 HRS/YEAR

REQUESTED LIMITS

20. Are you requesting any permit limits?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, check all that apply below)
<input type="checkbox"/> Operation Hour Limit(s):	
<input type="checkbox"/> Production Limit(s):	
<input checked="" type="checkbox"/> Material Usage Limit(s):	
<input type="checkbox"/> Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
<input type="checkbox"/> Other:	EMISSION LIMITS ON TAPS AND PM10
21. Rationale for Requesting the Limit(s):	EMISSIONS MUST BE CONTROLLED TO COMPLY WITH AMBIENT AIR QUALITY STANDARDS

3.3 STS Gen5 Tube Spray Chamber

The STS Gen5 Tube Spray Chamber (Gen5) is used to apply metal powder to 304 SS tubes via the plasma spray process and metal wire to SS tubes via the wire arc spray process. This unit is permitted in the existing PTC and has undergone no equipment changes, except that the discharge of the emission control equipment will be modified from a horizontal to vertical orientation. NxEdge requests changes to the permit limits which will allow unrestricted coating of tubes (based on equipment capacity) with aluminum, silicon, and zirconium powders and molybdenum, tin, titanium/aluminum and zinc/aluminum wires. In addition, NxEdge requests changes to the permit limits which will allow restricted coating of tubes with wire containing nickel and chromium.

When Gen5 is in plasma spray operations, a Brigs Model BPC-180 Spray Gun is used to apply metal powders to the exterior of tubes typically measuring 6-10 feet long and 6 inches in diameter. When Gen5 is in wire arc spray operations, a Sulzer Metco Model SmartArc PPG Spray Gun is used to apply wire to the exterior of the SS tubes. Emissions from Gen5 are controlled via a downstream cyclone and cartridge filter assembly (FARR2) manufactured by Camfil Farr. The filter assembly is a Farr Model GS24 loaded with 20 cartridges. A 5000 CFM rated fan located on the outlet of the filter assembly draws air from the process area, through the Gen5 chamber, and then through ducting to the cyclone and filter assembly, both located outdoors. With this modification, the fan will discharge vertically directly above the filter assembly at a height of 20 feet. The emission point, EP-13 is shown on Form PP.

Metal and particulate emissions from Gen5 are calculated in Table 3-3A (attached). All particulate emissions are conservatively assumed to be PM_{10} . Uncontrolled emissions are estimated using the maximum applicator rate, 24 hours per day, 365 days per year. Attached is a letter from Brig's Machining Company specifying the maximum throughput of the Brigs spray gun as 230 grams per minute (30.4 pounds per hour). Attached also is a specification sheet for the SmartArc gun stating the maximum throughput of the spray gun as 70 pounds per hour.

Uncontrolled emissions from Gen5's plasma spray operations are reduced by the amount of powder deposited on the tubes. Since Gen5 will use the same applicator as Gen3 to coat tubes with silicon and aluminum, the 27 wt% DE determined for Gen3 is used to estimate Gen5 emissions (see Table 3.1B). Zirconium (Zr) plasma spray is a new operation being proposed in this PTC modification, and DE test results are not available. Therefore, an estimated DE of 25 wt% is used in the Table 3.3A emission calculations for this coating.

Uncontrolled emissions from Gen5's wire spray operations are reduced by the amount of wire deposited on the tube. The average deposition efficiency (DE) for tin and zinc-aluminum wire coating in Gen5, as determined by NxEdge testing, is 53 and 54 wt%, respectively. Table 3-3B details the DE test results. Molybdenum, nickel alloy, and titanium-aluminum wire arc spray are new operations being proposed in this PTC modification, and DE test results are not available. Therefore,

an estimated DE of 50 wt% is used in the Table 3.3A calculations for these coatings.

Table 3-3B: Gen5 Deposition Efficiency

Date Sprayed	Coating	Pre-Coated Tube Weight (lbs) ¹	Final Coated Tube Weight (lbs)	Coating Used (lbs)	Deposition Efficiency (%)
4-Sep-07	Si-Al Powder	91.1	129.6	143.3	26.9%
4-Sep-07	Si-Al Powder	93.7	130.5	131.9	27.9%
6-Sep-07	Si-Al Powder	91.9	136.0	158.1	27.9%
6-Sep-07	Si-Al Powder	91.3	128.7	138.0	27.1%
7-Sep-07	Si-Al Powder	91.9	128.1	151.6	23.9%
11-Sep-07	Si-Al Powder	102.1	162.9	233.0	26.1%
11-Sep-07	Si-Al Powder	109.0	169.0	199.8	30.0%
14-Sep-07	Si-Al Powder	94.8	156.0	250.0	24.5%
Average Si-Al D.E.=					27%
4-Apr-07	Zn-Al Wire	100	256.9	301.0	52.1%
10-Apr-07	Zn-Al Wire	100	250.8	290.5	51.9%
11-Apr-07	Zn-Al Wire	100	261.9	300.3	53.9%
12-Apr-07	Zn-Al Wire	100	252.7	308.2	49.5%
17-Apr-07	Zn-Al Wire	100	255.1	295.0	52.6%
18-Apr-07	Zn-Al Wire	100	254.4	305.0	50.6%
19-Apr-07	Zn-Al Wire	100	297.3	297.3	66.4%
24-Apr-07	Zn-Al Wire	100	250.7	288.1	52.3%
Average Zn-Al D.E.=					54%
11-Dec-06	Tin Wire	100	290.2	360.0	52.8%
11-Dec-06	Tin Wire	100	291.0	358.0	53.4%
1-Apr-07	Tin Wire	100	291.6	375.4	51.0%
2-Apr-07	Tin Wire	100	290.9	333.6	57.2%
25-Apr-07	Tin Wire	100	263.4	355.7	45.9%
26-Apr-07	Tin Wire	100	296.0	343.2	57.1%
30-Apr-07	Tin Wire	100	285.3	346.0	53.6%
Average Tin D.E.=					53%
Notes: 1. Pre-coated tube weight for ZnAl and Tin assumed to be 100 lbs.					

Elemental chromium is present in the proposed nickel-chromium wire feed to Gen5. While hexavalent chromium (Cr(VI)) is not present in the wire, industry stack tests have measured

emissions of Cr(VI) from thermal spraying facilities, indicating that some chromium conversion occurs during the spray process.⁴ This conversion was quantified in a 2004 California Air Resources Board report which surveyed existing research and sponsored studies to develop emission estimation methods for thermal spraying.⁵ An excerpt of the study is attached and includes a summary table (Table C-3) of emission factors for Cr(VI) emissions based on the amount of chromium in the process feed. The uncontrolled emission factor for the twin-wire electric arc spray process is 0.00696 pounds Cr(VI) per pound of chromium sprayed. This factor is used to estimate Cr(VI) uncontrolled emissions from Gen5.

The uncontrolled emissions of all TAPs in the Gen5 coatings would violate ambient air quality standards. Therefore, controlled emissions are calculated.

Controlled TAP emissions are calculated based on a control efficiency of 99.99 wt%, as certified by the filter manufacturer. During plasma operation, Farr DPT-200 polyester filters are loaded in FARR2. During wire spray operations, Farr HMPT-325 cellulose/polyester filters are loaded in FARR2. Attached are filter certification letters from Farr APC specifying 99.99% control efficiency for both Farr filter types.

Except for nickel and Cr(VI), all controlled TAP emissions are based on unrestricted, continuous operations 8760 hours per year. The feed rates of nickel-chromium and nickel-vanadium wires are restricted so that controlled emissions rates of nickel and Cr(VI) meet ambient air quality standards while also meeting NxEdge's projected production needs. The controlled TAP emission rates for Gen5 are shown in the TAP Emissions Summary in Table 3.3A. These are the proposed permit limits for Gen5.

Controlled annual PM₁₀ emissions from Gen5 are calculated based on continuous operations 8760 hours per year and a control efficiency of 99.99 wt%, as certified by Farr. Controlled hourly PM₁₀ emissions are based on the 0.002 grains per cubic foot filter outlet rate guaranteed by Farr at the maximum allowable filter loading. Permitting at this rate allows flexibility if short term particulate feed rates are higher than expected. Based on these control efficiencies, the controlled hourly and annual PM₁₀ rates are 0.185 pounds per hour and 0.024 tons per year, proposed permit limits.

⁴ "Appendix C: Methodology for Estimating Hexavalent Chromium Emissions from Thermal Spraying," California Air Resources Board, www.arb.ca.gov/regact/thermspr/appc.doc.

⁵ Ibid.

Table 3-3A: STS Area Emissions- Gen 5

EMISSION CALCULATIONS WITH UNRESTRICTED FEED AND PRODUCTION RATES																					
STS Source: PLGEN5	Tube Coating	Coating	Content	CAS Number	Content Conc. (wt% per MSDS)	Application Device	Equipment Maximum Feed Rate (lb/hr) <small>Notes 1,2</small>	Max Coating in Pre-mixed Feed (%)	Daily Operating Hours	Daily Coating Use (lbs)	Yearly Operating Days	Annual Coating Use (lbs)	Coating Retention on Target (%) <small>Note 3</small>	Uncontrolled Hourly Emissions (lb/hr)	585/586 TAP Screening Level (lb/hr)	Uncont. Annual Emissions (lb/yr)	FARR2 Filter Unit: Filter Type (currently)	Control Equipment Efficiency (%) <small>Note 4</small>	Controlled Hourly Emissions (lb/hr)	Controlled Annual Emissions (lb/yr)	
		Aluminum Powder	Aluminum	7429-90-5	100.0%	Brigs BPC-180	30.4	60%	24	438	365	159764	27%	13.3	0.667	116628	Farr DPT-200 Polyester	99.99%	0.0013	11.7	
		Lime	Ca(OH) ₂	1305-62-0	65.0%	Injected (20 lb/hr) in cyclone outlet when Tin Wire is applied				24	480	365	175200	0%	13.0	0.333	113880	Farr HMPT-325	99.99%	0.0013	11.4
			Mg(OH) ₂	1309-42-8	35.0%										7.0	non-TAP	61320			0.00070	6.1
		Moly Wire <small>Note 5</small>	Molybdenum	7439-98-7	100.0%	SmartArc	70	100%	24	1680	365	613200	50%	35.0	0.667	306600	Farr HMPT-325 Cellulose/PE	99.99%	0.0035	30.7	
		NiCr Wire <small>Note 5</small>	Nickel	7440-02-0	50.0%	SmartArc	70	100%	24	1680	365	613200	50%	17.5	2.7E-05	153300	Farr HMPT-325 Cellulose/PE	99.99%	0.0017	15.3	
			Chromium	7440-47-3	50.0%									17.5	0.033	153300			0.0017	15.3	
			Cr (VI) <small>Note 6</small>	18540-29-9	0%									0.24	5.6E-07	2134			2.44E-05	0.21	
		NiVa Wire <small>Note 5</small>	Nickel	7440-02-0	90.0%	SmartArc	70	100%	24	1680	365	613200	50%	31.5	2.7E-05	275940	Farr HMPT-325 Cellulose/PE	99.99%	0.0031	27.6	
			Vanadium	7440-62-2	20.0%									7.0	0.003 <small>Note 9</small>	61320			0.00070	6.1	
		Silicon Powder	Silicon	7440-21-3	100.0%	Brigs BPC-180	30.4	98%	24	715	365	260948	27%	21.7	0.667	190492	Farr DPT-200 Polyester	99.99%	0.0022	19.0	
		Tin Wire	Tin	7440-31-5	100.0%	SmartArc	70	100%	24	1680	365	613200	53%	32.9	0.133	288204	Farr HMPT-325 Cellulose/PE	99.99%	0.0033	28.8	
		TiAl Wire <small>Note 5</small>	Titanium		50.0%	SmartArc	70	100%	24	1680	365	613200	50%	17.5	non-TAP	153300	Farr HMPT-325 Cellulose/PE	99.99%	0.0017	15.3	
			Aluminum	7429-90-5	50.0%									17.5	0.667	153300			0.00175	15.3	
		Zirconium Powder	Zr Oxide	1314-23-4	91%	Brigs BPC-180	30.4	100%	24	730	365	266304	25%	20.7	0.333	181752	Farr DPT-200 Polyester	99.99%	0.0021	18.2	
			Yttrium Oxide	1314-36-9	13%									3.0	0.067	25965			0.00030	2.6	
			Hafnium Oxide	12055-23-1	1.8%									0.41	0.033	3595			4.1E-05	0.36	
		Zn/Al Wire	Zinc	7440-66-6	99.0%	SmartArc	70	100%	24	1680	365	613200	54%	31.9	0.667	279251	Farr HMPT-325 Cellulose/PE	99.99%	0.0032	27.9	
			Aluminum	7429-90-5	16.5%									5.3	0.667	46542			0.00053	4.7	
			Cadmium	7440-43-9	0.005%									1.6E-03	3.7E-06	14.1			1.6E-07	0.0014	
			Copper	7440-50-8	0.75%									0.24	0.067	2116			2.4E-05	0.21	
			Iron	7439-89-6	0.75%									0.24	non-TAP	2116			2.4E-05	0.21	
			Lead	7439-92-1	0.007%									2.3E-03	non-TAP	19.7			2.3E-07	0.0020	
Titanium	7440-32-6		0.20%	0.064	non-TAP									564	6.4E-06	0.06					

EMISSION CALCULATIONS WITH RESTRICTED ANNUAL FEED AND PRODUCTION RATES (Note 7)													
STS Source: PLGEN5	Tube Coating	Coating	Content	CAS Number	Content Conc. (wt% per MSDS)	Application Device	Restricted Annual Coating Use (lbs)	Restricted Annual Targets <small>Note 8</small>	Coating Retention on Target (%) <small>Note 3</small>	FARR2 Filter Unit: Filter Type (currently)	Control Equipment Efficiency (%) <small>Note 4</small>	Controlled Annual Avg Emissions (lb/hr)	Cont. Annual Emission (lb/yr)
		NiCr Wire <small>Note 5</small>	Nickel	7440-02-0	50.0%	SmartArc	13500	30	50%	Farr HMPT-325 Cellulose/PE	99.99%	3.9E-05	0.34
			Chromium	7440-47-3	50.0%							—	0.34
			Cr (VI) <small>Note 6</small>	18540-29-9	0%							5.4E-07	0.0047
		NiVa Wire <small>Note 5</small>	Nickel	7440-02-0	90.0%	SmartArc	4500	10	50%	99.99%	2.3E-05	0.20	
			Vanadium	7440-62-2	20.0%						—	0.045	

Notes: lb/hr).

2. Per manufacturer, SmartArc maximum deposition rate is 70 lb/hr.

3. Based on NxEdge testing except for molybdenum, nickel/chromium, nickel/vanadium and titanium/aluminum, which are estimated at 50% based on other metals (see Table 3-3B).

4. Cyclone efficiency (pre-filter) estimated at 80%, but no certification data available so cyclone emission control not included. For FARR cartridge filters, efficiency is certified at 99.99% for particle sizes of 0.5 micron and larger.

5. Mo, NiCr, NiVa and TiAl wire composition based on projected blend, not MSDS.

6. Conversion of chromium to hexavalent chromium in wire arc spray process is 0.00696 lb Cr(VI) generated per lb of Cr feed (source: CA EPA Air Resources Board).

7. Production restrictions only required for chromium and nickel and only affect annual emission limits.

8. NxEdge estimates 450 lbs of wire will be sprayed per target.

9. Screening Emission Level for vanadium provided as V₂O₅. Assume all vanadium emissions become oxidized. V₂O₅ = 68 wt% V.10. Total PM₁₀ emissions based on maximum possible Gen5 operations. Proposed Modification Uncontrolled PM₁₀ Rate is based on continuous 70 lb/hr SmartArc feed less 50% deposition efficiency plus lime emissions. Proposed Modification controlled annual PM₁₀ rate includes 99.99% control equipment efficiency. Proposed controlled hourly PM₁₀ rate based on 0.002 grains/CF and 5000 CFM fan rating.

Toxic Air Pollutants Emissions Summary	Gen 5 Plasma and Wire Arc Spray	TAP Type (24 hr or Annual Ave. EL)	TAP Screening Emission Level (lb/hr)	Controlled Hourly Emissions			
				Uncontrolled Proposed Mod. (lb/hr)	Current Permit (lb/hr)	Proposed Mod. (lb/hr)	Proposed Mod. (lb/yr)
	Aluminum	585 (24 hr)	0.667	17.5	0.00069	0.0036	31.6
	Cadmium	586 (Annl)	3.7E-06	1.61E-03	8.22E-08	1.6E-07	1.4E-03
	Calcium Hydroxide	585 (24 hr)	0.333	13.0	0.108	0.0013	11.4
	Chromium	585 (24 hr)	0.033	17.5	0	0.0017	15.3
	Chromium(VI)	586 (Annl)	5.6E-07	0.24	0	5.4E-07	4.7E-03
	Copper (dust)	585 (24 hr)	0.067	0.24	3.13E-05	2.4E-05	0.21
	Hafnium	585 (24 hr)	0.033	0.41	0	4.1E-05	0.36
	Molybdenum	585 (24 hr)	0.667	35.0	0	0.0035	30.7
	Nickel	586 (Annl)	2.7E-05	31.5	0	6.2E-05	0.54
	Silicon	585 (24 hr)	0.667	21.7	0	0.0022	19.0
	Tin	585 (24 hr)	0.133	32.9	0.018	0.0033	28.8
	Vanadium Oxide (Note 9)	585 (24 hr)	0.003	10.3	0	0.0010	9.0
	Yttrium	585 (24 hr)	0.067	3.0	0	0.00030	2.6
	Zinc	585 (24 hr)	0.667	31.9	0.0041	0.0032	27.9
	Zirconium	585 (24 hr)	0.333	20.7	0	0.0021	18.2

Hazardous Pollutants Emissions Summary	Gen 5	Controlled Emissions (tons/yr)
	Cadmium	7.1E-07
	Chromium	1.7E-04
	Lead	9.9E-07
	Nickel	2.7E-04
Total =		4.4E-04

Criteria Pollutants Emissions Summary	Gen 5 Plasma and Wire Arc Spray	Significant Emission Rate (tons/yr)	Uncontrolled Annual Emissions		Controlled Hourly Emissions		Max. Controlled Annual Emissions				
			Current Permit (ton/yr)	Proposed Mod. (ton/yr)	Current Permit (lb/hr)	Proposed Mod. (lb/hr)	Current Permit (ton/yr)	Proposed Mod. (ton/yr)	Emission Change, ton/yr		
			Lead	0.6	2.5E-04	9.9E-03	2.9E-07	2.3E-07	5.0E-07	9.9E-07	4.8E-07
			PM ₁₀ Note 10	15	48.2	240.9	0.185	0.0857	0.365	0.024	-0.341



NxEdge PTC Mod

Gen5 Spray Applicator Max Throughput

23190 DEL LAGO • LAGUNA HILLS, CA 92653
PHONE: (949) 770-1160 FAX: (949) 770-6717
E-MAIL: INFO@LPPS.COM

DATE: JULY 2, 2007

TO: PAUL ROBINSON
NXEDGE, INC.
PHONE: (208) 362-7200
FAX: (208) 362-7248

FROM: Gary Hislop
BRIGS MACHINING
COMPANY
PHONE: (949) 770 1160
FAX: (949) 770 6717

PAGES: 2

RE: Throughput of BPC-180 PIASMA GUN

The BPC-180 Plasma Gun systems maximum throughput is 230 grams per minute in ideal conditions
Using the BPC-180 Plasma Gun with the 171D-Powder Feeder

We hope that this this is the information that you need. If you have any questions please feel free to call
us. We look forward to working with you.

Best Regards

BRIG'S MACHINING COMPANY
Gary Hislop

SULZER**Sulzer Metco**

1 General Description

The high power capacity (400 Amps) allows SmartArc to deposit coatings from both hard and soft wires very quickly and economically. Hard wire coatings produced using the SmartArc system have excellent bond strength, high hardness, low porosity and are easily machined. When soft wires are used, exceptionally high speed coatings rates of up to 32 kg/h (70 lbs/hr) are possible.

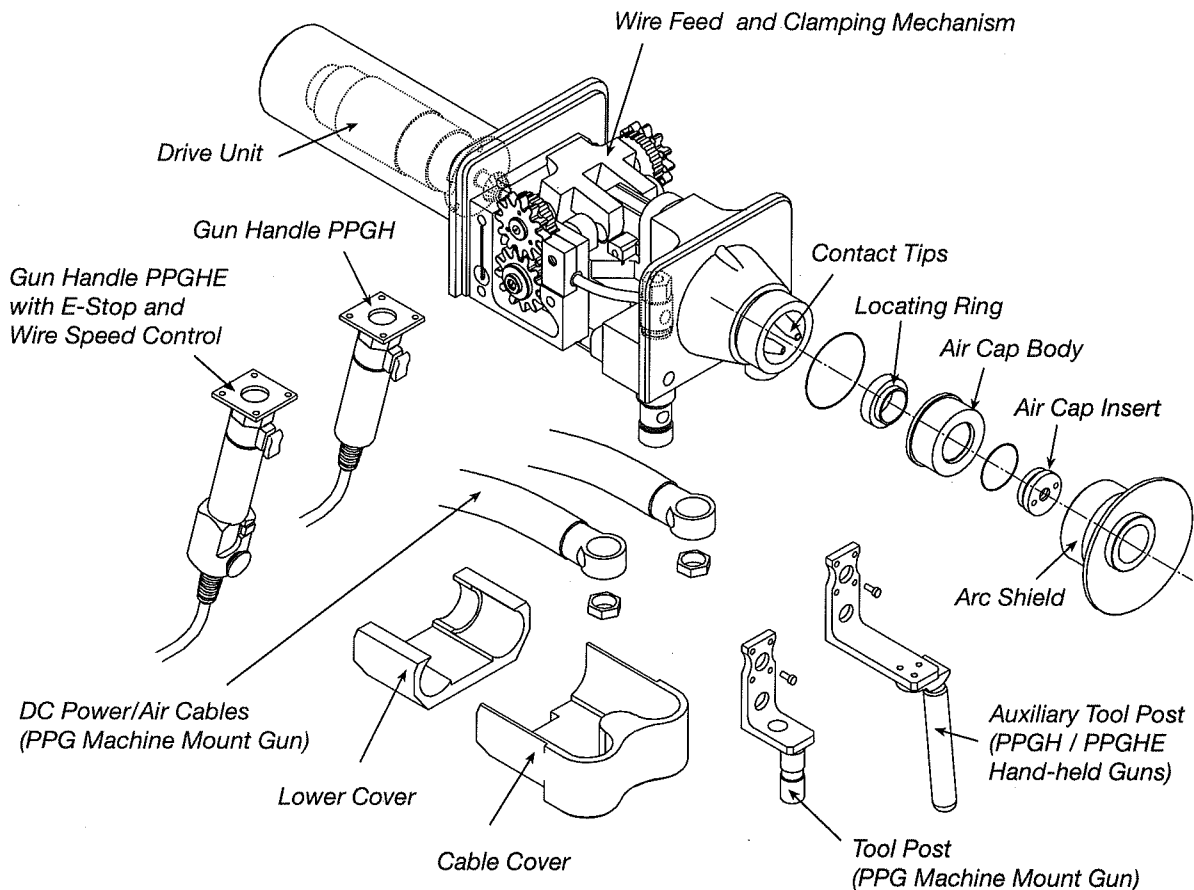
SmartArc incorporates a leading-edge gun head design that delivers low-turbulence, nearly laminar air flow. This results in high deposition rates, very dense, low oxide coatings and a reduction in consumables and maintenance. Voltage measurement is at the gun for reliability of coating results.

A unique feature of SmartArc is load-sharing; a patented motor control method that provides "push-pull" coordination of the wire feed stock. As a result, wire feed is very smooth, allowing wire conduit cables of up to

15 meters (50 feet). This allows the SmartArc PPG gun to be mounted on a robot or other gun manipulation equipment, for added precision and automation. When the gun "pull" motor, acting as the controller, needs assistance, SmartArc senses the load and has the console motor "push" harder to ensure highly consistent wire feed.

Truly automated, SmartArc incorporates a rugged and reliable PLC (programmable logic control) computer technology for its advanced feature capability and provides diagnostics tests that are easily interpreted by the operator.

Three gun models are available for the SmartArc system. The PPG gun (CE conformant) is a machine-mount push-pull design. Hand-held models are also available as the PPGH and the CE-conformant PPGHE. The PPGHE gun incorporates an integrated, system-wide E-stop on the handle and a wire speed control.



SmartArc™ Gun • Main Parts Overview